CLAIMS

What is claimed is:

1. An electromagnetic interference filtering apparatus comprising:

a first filter with a first end and a second end, said first end is operably connected in series with said first power input terminal, said second end is operably connected to a first output terminal; and

an impedance comprising a first conductor on a first layer of a circuit card forming a distributed inductance in series with said filter, said impedance also including a second conductor on a second layer of said circuit card operably connected to a ground, said first conductor and said second conductor forming a distributed capacitance, and wherein said impedance is configured to facilitate matching of an input impedance of the filtering apparatus with that of a voltage source and said distribute inductance and said distributed capacitance cooperate to provide filtering of electromagnetic interference.

2. The apparatus of claim 1 further including a second filter operably connected to a first power input terminal and a ground;

3. The apparatus of claim 1 wherein said second filter comprises a first capacitor and a second capacitor, each capacitor with a first end and a second end, wherein said first end of said first capacitor is operably connected to said first power input terminal and said second end is operably connected to a ground and wherein said first end of said second capacitor is operably connected to said second power input terminal and said second end is operably connected to said ground.

4. The apparatus of claim 1 further including a third filter with a first end and a second end, said first end is operably connected in series with said second power input terminal and said second end is operably connected to a second output terminal; and

5. The apparatus of claim 4 further including another impedance comprising a third conductor on a first layer of a circuit card forming a distributed inductance in series with said third filter, said another impedance also including a fourth conductor on a second layer of said circuit card operably connected to a ground, said third conductor and said fourth conductor forming a distributed capacitance, and wherein said impedance is configured to facilitate matching of an input impedance of the filtering apparatus with that of a voltage source.

6. The apparatus of claim 1 further including a fourth filter.

7. The apparatus of claim 6 wherein said fourth filter comprises a fourth capacitor and a fifth capacitor, each capacitor with a first end and a second end, wherein said first end of said fourth capacitor is operably connected to said first output terminal and said second end is operably connected to a ground and wherein said first end of said fifth capacitor is operably connected to said second output terminal and said second end is operably connected to a ground.

8. The apparatus of claim 1 further including at least one of: a first bus bar operably connected to said first power input terminal and said circuit card; and a second bus bar operably connected to said second power input terminal and said circuit card, said first bus bar and said second bus bar comprising a preformed conductor.

9. The apparatus of claim 8 wherein said first and second bus bars are configured to conduct current from an input connector to said circuit card, said first and said second bus bars including a flat portion to facilitate conduction with a conductor of said circuit card.

10. The apparatus of claim 8 wherein said first and second bus bars are configured to substantially eliminate strain exerted on said circuit card.

11. The apparatus of claim 8 wherein said first and second bus bars are configured to facilitate matching of an input impedance of the filtering apparatus with that of a voltage source.

12. The apparatus of claim 8 wherein said first and second bus bars are configured to eliminate cable to connector crimp connections to reduce power dissipation and heat generation.

13. The apparatus of claim 1 further including a first and a second of transient absorption devices each transient absorption device with a first end and a second end, wherein said first end of said first transient absorption device is operably connected to said first power input terminal and said second end is operably connected to a chassis ground and wherein said first end of said second transient absorption device is operably connected to said second power input terminal and said second end is operably connected to said chassis ground.

14. The apparatus of claim 1 further including a transient absorption device with a first end and a second end, wherein said first end of said first transient absorption device is operably connected to said first power terminal and said second end is operably connected to said second power terminal.

15. The apparatus of claim 1 further including a first and a second resistor-capacitor filter comprising a series combination of a resistor and a capacitor, each resistor-capacitor filter with a first end and a second end, wherein said first end of said first resistor-capacitor filter is operably connected to said first power input terminal and said second end is operably connected to a chassis ground and wherein said first end of said second resistor-capacitor filter is operably connected to said second power input terminal and said second end is operably connected to a chassis ground.

16. The apparatus of claim 1 wherein said first and second power terminal corresponding to a voltage source and a ground reference.

17. The apparatus of claim 1 wherein said first filter comprises an inductance and capacitance operably connected in parallel.

18. The apparatus of claim 1 further including a third and a fourth transient absorption device each transient absorption device with a first end and a second end, wherein said first end of said first transient absorption device is operably connected to said first output terminal and said second end is operably connected to a chassis ground and wherein said first end of said second transient absorption device is operably connected to said second output terminal and said second end is operably connected to said chassis ground.

19. The apparatus of claim 1 further including another transient absorption device with a first end and a second end, wherein said first end of said first transient absorption device is operably connected to said first output terminal and said second end operably connected to said second output terminal.

20. The apparatus of claim 1 further including a first and a second positive temperature coefficient device, each positive temperature coefficient device with a first end and a second end, wherein said first end of said first positive temperature coefficient device is operably connected to said first output terminal and said second end is operably connected to a load and wherein said first end of said second positive temperature coefficient device is operably connected to said second output terminal and said second end operably connected to said load.

21. The apparatus of claim 1 further including a connector in operable communication with said first power input terminal.

22. A method of filtering and matching impedance in a power line electromagnetic interference filter and surge suppression apparatus comprising:

filtering input power on a power line with a first filter with a first end and a second end, said first end is operably connected in series with said first power input terminal, said second end is operably connected to a first output terminal; and

forming an impedance comprising a first conductor on a first layer of a circuit card forming a distributed inductance in series with said filter, said impedance also including a second conductor on a second layer of said circuit card operably connected to a ground, said first conductor and said second conductor forming a distributed capacitance wherein said impedance is configured to facilitate matching of an input impedance of the electromagnetic interference filter with that of a voltage source and said distributed inductance and said distributed capacitance cooperate to provide filtering of electromagnetic interference.

23. The method of claim 22 further including filtering with a second filter operably connected to a first power input terminal and a ground;

24. The method of claim 22 wherein said second filter comprises a first capacitor and a second capacitor, each capacitor with a first end and a second end, wherein said first end of said first capacitor is operably connected to said first power input terminal and said second end is operably connected to a ground and wherein said first end of said second capacitor is operably connected to said second power input terminal and said second end is operably connected to said ground.

25. The method of claim 22 further including filtering with a third filter with a first end and a second end, said first end is operably connected in series with said second power input terminal and said second end is operably connected to a second output terminal; and

26. The method of claim 25 further including forming another impedance comprising a third conductor on a first layer of a circuit card forming a distributed inductance in series with said third filter, said another impedance also including a

fourth conductor on a second layer of said circuit card operably connected to a ground, said third conductor and said fourth conductor forming a distributed capacitance wherein said impedance is configured to facilitate matching of an input impedance of the electromagnetic interference filter with that of a voltage source.

27. The method of claim 22 further including filtering with a fourth filter

28. The method of claim 27 wherein said fourth filter comprises a fourth capacitor and a fifth capacitor, each capacitor with a first end and a second end, wherein said first end of said fourth capacitor is operably connected to said first output terminal and said second end is operably connected to a ground and wherein said first end of said fifth capacitor is operably connected to said second output terminal and said second end is operably connected to a ground.

29. The method of claim 22 further including at least one of connecting said first power input terminal and said circuit card with a first bus bar; and connecting second power input terminal and said circuit card with a second bus bar, at least one of said first bus bar and said second bus bar comprising a preformed conductor.

30. The method of claim 29 wherein said connecting includes configuring said first and second bus bars to conduct current from an input connector to said circuit card, said first and said second bus bars including a flat portion to facilitate conduction with a conductor of said circuit card.

31. The method of claim 29 wherein said connecting includes configuring said first and second bus bars to substantially eliminate strain exerted on said circuit card.

32. The method of claim 29 wherein said connecting includes configuring said first and second bus bars to facilitate matching of an input impedance of the electromagnetic interference filter with that of a voltage source.

33. The method of claim 30 wherein said connecting eliminates cable to connector crimp connections to reduce power dissipation and heat generation.

34. The method of claim 22 further including suppressing transients with a first and a second of transient absorption devices each transient absorption device with a first end and a second end, wherein said first end of said first transient absorption device is operably connected to said first power input terminal and said second end is operably connected to a chassis ground and wherein said first end of said second transient absorption device is operably connected to said second power input terminal and said second end is operably connected to said chassis ground.

35. The method of claim 22 further including absorbing transients with a transient absorption device with a first end and a second end, wherein said first end of said first transient absorption device is operably connected to said first power terminal and said second end is operably connected to said second power terminal.

36. The method of claim 22 further including filtering with a first and a second resistor-capacitor filter comprising a series combination of a resistor and a capacitor, each resistor-capacitor filter with a first end and a second end, wherein said first end of said first resistor-capacitor filter is operably connected to said first power input terminal and said second end is operably connected to a chassis ground and wherein said first end of said second resistor-capacitor filter is operably connected to said second power input terminal and said second end is operably connected to a chassis ground.

37. The method of claim 22 wherein said first and second power terminal corresponding to a voltage source and a ground reference.

38. The method of claim 22 wherein said first filter comprises an inductance and capacitance operably connected in parallel.

39. The method of claim 22 further including absorbing transients with a third and a fourth transient absorption device each transient absorption device with a first end and a second end, wherein said first end of said first transient absorption device is operably connected to said first output terminal and said second end is operably connected to a chassis ground and wherein said first end of said second transient absorption device is operably connected to said second output terminal and said second end is operably connected to said chassis ground.